DEPICTION OPTIMIZATION OF OVERDUE WI-FI OFFLOADING IN HETEROGENEOUS SYSTEMS

R. Kayalvizhi[1] and **M. Nivetha**[1*]

[1] Department of Computer Science and Engineering, A.R.J. College of Engineering and Technology, Mannargudi.

ARTICLE INFO

ABSTRACT

The fast growing mobile data traffic causes the deficiency of cellular network capacity. To mitigate this problem, Wi-Fi offloading techniques where the mobile data traffic is offloaded through sparsely deployed Wi-Fi networks have been extensively investigated. Wi-Fi offloading techniques can be classified into: 1) auction game-based offloading and 2) congestion game-based offloading. To proposed system inventing a Finite Horizon Markov Decision Process (FHMDP) to make offloading decisions efficiently. The existing approach use two algorithms such as; 1) Hybrid offloading algorithm and 2) Monotone offloading algorithm. But the previous work of hybrid offloading algorithm and monotone offloading algorithm was not efficient. Based on the Finite Horizon Markov Decision Process (FHMDP) mechanism. The proposed mechanism of offload cellular network traffic of vehicular users through carrier Wi-Fi networks based on the game theory approach. It computes the mobile network offloading performance. In this design of offloading mechanism in order to improve the overall offloading performance. By reducing the number of vehicular users contending for the channel and prioritizing high WIFI data rates and thus the offloading performance can be improved. In the proposed approach is reducing the accessing cost, time and improve the Wi-Fi offloading performance.

INTRODUCTION

One of the most engaging challenges for mobile operators today is how to manage the exponential data traffic. The existing strategy are classify into two main categories,

according to their requirements in terms of content delivery guarantees such as, delayed and non-delayed offloading. Finally, they describe and needed to implement mobile data offloading in the access network, as they as current and future research challenges. To increasing popularity of smart phones and the introduction of affordable data plans by cellular operators. Users are use more popular data hungry mobile applications, such as audio, and video streaming, sharing or cloud based services.

In this project are divided in to two categories such as existing approaches and proposing approach use two algorithms like, hybrid offloading algorithm and monotone offloading algorithm. The hybrid offloading algorithm used for delay sensitive information and delay tolerant. Then monotone offloading algorithm reduce the computational complexity. The existing approach where the mobile data traffic cause the deficiency of cellular network. To mitigate this problem of Wi-Fi offloading techniques can be classified in to 1) auction game based offloading and 2) congestion game based offloading. It based on game theory approach. The proposed approach is FHMDP. Finite Horizon Markov Decision Process (FHMDP) used to formulate the many decision making problem in science and engineering. The objective is making best decisions (action selection) and minimize the cost. It's applicable to multi agent systems, telecommunication, queuing and etc. In this project, they present a comprehensive survey of data offloading techniques in cellular networks. To mitigate this problem, with the aim to minimize the communication cost and satisfy delay constraints by offloading mobile data. It applicable with Wi-Fi network and D2D communications. FHMDP planning phase can be implemented in remote cloud and ease the heavy burden of complex data offloading management. The offloading algorithm (FHMDP) can be support different delay requirements. In this approach reducing the access cost, time and improve the Wi-Fi offloading performance.

RELATED WORK

Existing system Mobile data offloading, initially focused for cellular system. Offloading moderates the aggregate of documents being carried on the cellular bands, freeing bandwidth for other consumers. It's also used in situations where local cell response may be humble, permitting the consumer to join via wired services with improved connectivity.

**Figure – 1:** *Sample Reduced State Transition for MS*
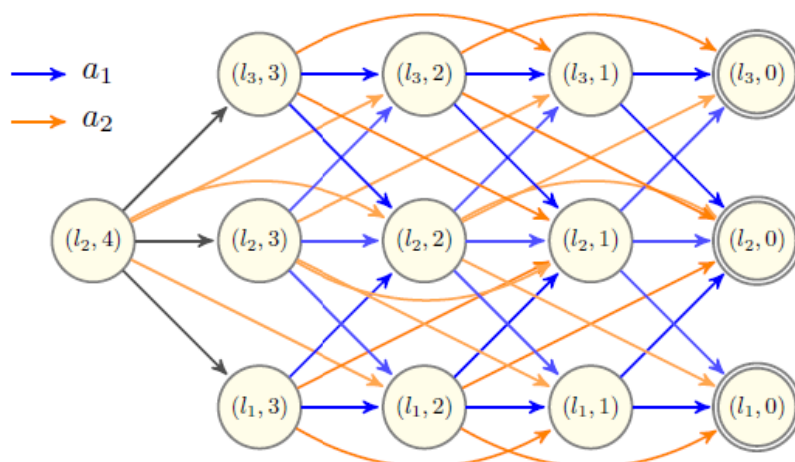
Propose a three offloading schema such as, hybrid offloading model, monotone offloading model, and MNO where multiple wireless networks are used to transfer mobile data. It can minimize the total communication cost by selecting different networks. If the Wi-Fi is available for our location, we can utilize the Wi-Fi data to communicate on D2D, downloading documents, video, audio, and etc. The modification in method is also operated by the detail that the additional technical growths and improvements in cellular design are bounds by physical limits.

PROPOSED SYSTEM

In this project, our proposed a Finite Horizon Markov Decision Process (FHMDP) to formulate this problem, with the aim to minimize communication costs and satisfy delay constraints. It possible with Wi-Fi network and D2D communication.Markov decision process is a useful model for sequential decision making, where MNO needs to take a sequence of actions. It formulate the data offloading problem, in hybrid wireless networks as an FHMDP model propose an offloading algorithm that can support different delay requirements. It prove that our proposed schema achieves the optimal policy and a lower computational complexity, lowest communication cost as compared with three offloading schema.

SYSTEM ARCHITECTURE
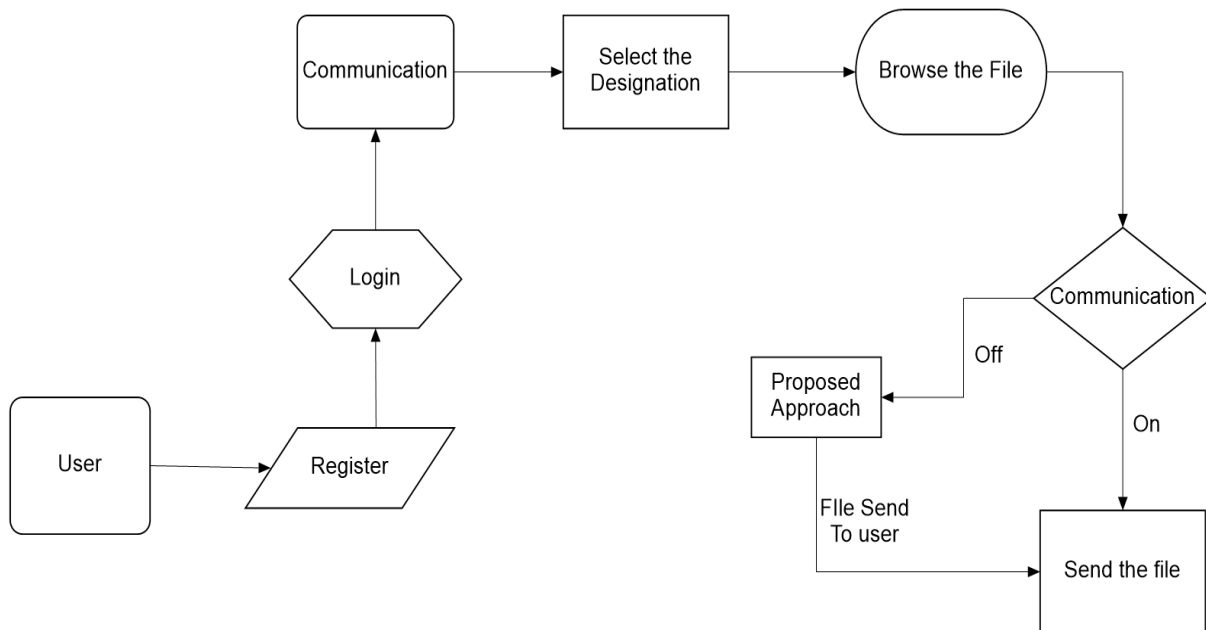
MODULES

1) User Registration Module
2) Communication Module
3) Admin Module
4) Existing Approach Module
5) Proposed Approach Module
6) View The File Transfer Details Module

MODULES DESCRIPTION

(1) User Registration Module: If need to enter the communication page, the user type the details and register it. The user correctly enter the registration details and display register successfully information on the message box. In security purpose, logging in (or logging on or signing in or signing on), is the process. To access the computer system by identifying and authenticating themselves. The user authentication process need a user name and a matching password are referred to as a login, (or a logon or a sign in or a sign on).

(2) Communication Module: A sender and a receivers convey the information through the communication channel. In telecommunication, a communication protocol is a system of rules that allow one or more attributes of a communication system to transmit information via any kind of physical quantity. These are the rules or protocols defines the communication and it used for error recovery methods. The protocols are implemented by any hardware or software or combination of both.

(3) Control unit Module: In this module, view the client information details and file information details. Administrator has the responsibility of ensuring the administrative activities within an organization run efficiently. It managed for all file details and client information.

(4) Existing Approach Module: The offloading mechanism can be installed in a vehicular user devices. For example the application is installed in our android phones. An offload engine can automatically offload vehicular user cellular traffic. The vehicular user need to set their satisfaction and then offload procedure is transparent to user. If the Wi-Fi is turn on condition, the file will be transferred to destination. Otherwise file dose not be transferred.

(5) Proposed Approach Module: If the user need to choose the source and destination node. And select the file to transfer the data. If the Wi-Fi is turn off condition that time the cellular network automatically turn on and then the file will be transferred to the destination.

(6) View the File Transfer Details Module: In telecommunications, a communication mechanism is a system of rules that allow two or more attributes of a communications system to transmit information to any kind of variation of a physical quantity. This module is used to view the communication and client information details.

CONCLUSION

A proposed a FHMDP data offloading model, use wifi network and D2D (Device to Device) communication to offload mobile data of MSs mobile stations. FHMDP to mitigate the problem of network traffic. It also includes hybrid and monotone offloading algorithm. For using a delay sensitive informations, delay tolerant applications and reduce the computational complexity caused by large data size and long deadline. Moreover, we established sufficient condition for the existence.

FUTURE ENHANCEMENT

A future enhancement improve the performance of our Finite Horizon Markov Decision Process. To improve the efficiency of time. Then Scalability and feasibility are improved and automatically "on" to the cellular network for Wi-Fi-offloading time.

REFERENCES

[1] Liu, D., Khoukhi, L., & Hafid, A., (2018) "Prediction-Based Mobile Data Offloading in Mobile Cloud Computing". IEEE Transactions on Wireless Communications, 17 (7), pp. 4660 - 4673, DOI: https://doi.org/10.1109/TWC.2018.2829513.

[2] Barbera, M. V., Kosta, S., Mei, A., & Stefa, J., (2013) "To offload or not to offload? The bandwidth and energy costs of mobile cloud computing". Proceedings - IEEE INFOCOM, pp. 1285–1293.

[3] Chen, M., Hao, Y., Li, Y., Lai, C.-F., & Wu, D., "On the computation offloading at ad hoc cloudlet: architecture and service modes," IEEE Communications Magazine, 53 (6), pp. 18 – 24.

[4] Cheng, N., Lu, N., Zhang, N., Shen, X. S., & Mark, J. W., (2014) "Opportunistic WiFi offloading in vehicular environment: A queueing analysis," in Global Communications Conference (GLOBECOM), 2014 IEEE. IEEE, 2014, pp. 211–216.

[5] Cisco (2016) "Cisco visual networking index: Global mobile data traffic forecast update, 2015-2020". Cisco, White Paper, 2016.

[6] Fall, K., (2003) "A delay-tolerant network architecture for challenged internets," in Proceedings of the 2003 conference on Applications, technologies, architectures, and protocols for computer communications. ACM, 2003, pp. 27–34. [Online]. Available: http://dl.acm.org/citation.cfm?id=863955.863960.

[7] Hema, A., Visalatchy, S., Mallika, C., & Ilakkiya, N., (2017) "A Survey Paper on Cloud Computing Security and Outsourcing Data Mining in Cloud Platform". International Journal of Advanced Scientific Research & Development (IJASRD), 4 (11/II), pp. 75 - 78. DOI: https://doi.org/10.26836/ijasrd/2017/v4/i11/41115.

[8] Jung, B. H., Song, N.-O. O., & Sung, D. K., (2014) "A network-assisted user-centric WiFi-offloading model for maximizing per-user throughput in a heterogeneous network". IEEE Transactions on Vehicular Technology, 63 (4), pp. 1940 – 1945.

[9] Lee, J., Yi, Y., Chong, S., & Jin, Y., (2014) "Economics of WiFi offloading: Trading delay for cellular capacity". IEEE Transactions on Wireless Communications, vol. 13, no. 3, pp. 1540–1554.

[10] Liu, D., (2017) "Data Offloading in Mobile Cloud Computing: A Markov Decision Process Approach". 2017 IEEE International Conference on Communications (ICC) - Ad-Hoc and Sensor Networking Symposium, pp. 1 - 6, DOI: https://doi.org/10.1109/ICC.2017.7997070.

[11] Maheswari, A., Sanjana, R., Sowmiya, S., Shenai, S., & Prabhakaran, G., (2016) "An Efficient Cloud Security System Using Double Secret Key Decryption Process for Secure Cloud Environments". International Journal of Advanced Scientific Research & Development (IJASRD), 3 (1/II), pp. 134 - 139.

[12] Mehmeti, F., & Spyropoulos, T., (2013) "Performance Analysis of Mobile Data Offloading in Heterogeneous Networks". GLOBECOM - IEEE Global Telecommunications Conference, pp. 1577–1583.

[13] Rebecchi, F., de Amorim, M. D., Conan, V., Passarella, A., Bruno, R., & Conti, M., (2015) "Data Offloading Techniques in Cellular Networks: A Survey". IEEE Communications Surveys & Tutorials, 17 (2), pp. 580 - 603, DOI: https://doi.org/10.1109/COMST.2014.2369742.

[14] Yetim, O. B., Martonosi, M., Yetim, B. O., & Martonosi, M., (2012) "Adaptive usage of cellular and WiFi bandwidth: An optimal scheduling formulation," in Proceedings of the seventh ACM international workshop on Challenged networks. ACM, 2012, pp. 69–72.